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ABSTRACT

In order to determine preservice teachers' reflective thinking and concerns as they addressed the complexities of supporting and augmenting their students' literacy instruction through computer activities, a systematic qualitative inquiry was conducted. The study was conducted in three schools within the same school district in south Mississippi. The 58 preservice teachers in the study were enrolled in one of three literacy early-field programs (prior to student teaching). Twenty-nine preservice teachers in a required six semester-hour reading/language arts block reported to Bay View Primary School (grades K-3) two mornings a week during the fall semester. Lessons centered around use of quality children's literature; reading, writing, and arts connections; promoting students' strategic reading through reading comprehension strategies; and integrating reading instruction with computer technology. Ten preservice teachers matriculating in a three semester-hour content reading class required for education majors seeing a concentration in reading reported to First Street Upper Elementary School (grades 4-5) two mornings a week during the spring semester. Lessons centered around use of strategies to promote students' comprehension of content text; writing in duel entry diaries; linking literacy with the arts; and relevant use of computers to enhance reading instruction. Nineteen preservice teachers studying content reading methods reported to Louis Middle School (grades 6-8) two mornings a week during the fall semester. Working in science, social studies or language arts classrooms, these preservice teachers followed the same schedule and lesson formats as those at First Street Upper Elementary. The preservice teachers also wrote two teaching cases describing their reflective thinking, concerns, and problems as they addressed the intricacies of devising and offering print-based literacy lessons augmented by computer technology. These cases served as the main data source for the inquiry. (Cases illustrating four concerns are described in this paper.) Despite the fact that findings of this inquiry cannot be generalized to other preservice teachers and teaching contexts, the research provides some narrative evidence that supports teaching cases as windows into preservice teachers' lived experiences and realities. Analysis of the cases highlighted concerns about integrating literacy lessons with computer technology in three different teaching contexts. (Contains 32 references.) (AEF)

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"I Did Not Plan Ahead": Preservice Teachers' Concerns Integrating Print-Based Literacy Lessons with Computer Technology

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"I Did Not Plan Ahead": Preservice Teachers' Concerns Integrating Print-Based Literacy Lessons with Computer Technology

"We are expanding the definition of what literacy means. Students read and interpret not just words on a page, but also icons on a computer screen...but although we incorporate different kinds of literacies into the classroom, we do not eliminate any of the 'old' literacies. We still expect students to read and write in the traditional way" (Tell, 1999, p. 7)

"Information technology ... particularly the Internet ... can help you gain knowledge. But first you need to know how to use it. And even if you know the basics, if you're not using the Internet to its fullest potential, you're likely missing out" (Goldsborough, 2000, p. 14)

"When I met my second grade students' classroom teacher one of my first questions was, 'Do you use the computers in your room and access the Internet very often?' To my surprise she answered, 'Not very often'" (preservice teacher's case, November, 2000)

Until recently, the term 'literacy' referred to the ability to read and write (Galda & Cullinan, 1997; Messaris, 1997). Now, literacy is defined as a multitude of interconnected proficiencies, including accessing information through electronic databases, critically interpreting facts on the Internet, and connecting and comparing ideas offered in print and electronic text (Reinking, Labbo, & McKenna, 1997).

Broadened conceptions of literacy are vigorously endorsed by exemplars listed on The National Council of Teachers of English/International Reading Association Standards (Farstrup & Myers, 1996) and benchmarks established by the American Library Association (ALA) (1998). Defining information literacy as "the ability to find, evaluate, and use information effectively" (1991, p. 152), the ALA suggests that teachers can and should support students' literacy learning "regardless of the medium ... print, visual, video, audio, or electronic" (Rafferty, 1999, p. 23). In addition, recently released National Technology Standards for Teacher Preparation Programs recommend that preservice teachers learn to weave technology with content lessons in authentic classroom situations (United States Department of Education, 2000).

In response to National Standards, and acknowledging expanded definitions of literacy, I now require preservice teachers in my three field-based literacy courses (language arts, reading

methods, and content reading), to integrate computer technology with their K-8 reading lessons at every relevant opportunity. Through such connections, I hope to develop my preservice teachers' recognition, expertise, and passion for what is possible when printed text and electronic forms of learning and communication are combined.

Studies that examine computer activities in classrooms have been limited (Kamil & Intrator, 1998). Moreover research has overlooked preservice teachers as one of the many interacting variables that might influence technology initiatives (see Reinking & Watkins, 2000). Yet, what preservice teachers learn and perceive about using technology in authentic school contexts has the capacity to positively or negatively impact their use of computers throughout their professional lives (see the National Technology Standards for Teachers and Teacher Preparation, 2000). Therefore, "pursuing such knowledge [about preservice teachers] is increasingly important given the growing availability and use of technology in schools" (Reinking & Watkins, 2000, p. 387). In order to determine my preservice teachers' reflective thinking and concerns as they addressed the complexities of supporting and augmenting their students' literacy instruction through computer activities, I decided to conduct a systematic qualitative inquiry. I wanted to add relevant, essential, pragmatic, field-based information that has been omitted from the literature. In addition, I hoped to enhance my own pedagogy by ascertaining exactly what type of problems my preservice teachers experienced as they extended their literacy lessons beyond conventional approaches to reading instruction.

Three School Contexts for the Study

I conducted the study in three schools, all located within the same school district in south Mississippi. Bay View Primary School is a 40-year old K-3, arts-based school. Bay View was 'wired' two years ago to accommodate use of computers throughout the school. There are one or two outdated, donated computers with printers in each classroom. The computers often are 'sluggish', or do not work at all. Because of electrical wiring difficulties, Internet access is sporadic.

Students at Bay View attend a computer lab 30 minutes a day, four times a week. The lab is staffed by two assistants who monitor the K-3 students as they work through self-paced tutorials in reading, math, and language arts. Keyboarding instruction is not offered. There is no 'resident computer expert' (e.g., a classroom teacher, media specialist or computer teacher), at Bay View who can assist teachers or students when they wish to expand their computer expertise, or remediate a computer malfunction.

First Street Upper Elementary School (grades 4 and 5) is over 60 years old and also recently was 'wired' for computer use. As is the case in Bay View Primary School, many of the donated computers in First Street School are old, react 'sluggishly', and malfunction often. There also are some recently purchased computers in each classroom. Students attend a 40 minute computer lab five days per week where they work through self-paced tutorials. Keyboard instruction is not offered to students. As is the case in Bay View School, there is no 'resident computer expert' at First Street School.

Louis Middle School (grades 6-8) was recently constructed and contains 'state-of-the art' computer hardware, software, and essential electrical wiring. All classrooms have at least four new computers with printers, and the media center contains 10 new computers. Ten more computers were recently purchased with grant funds.

The librarian/media specialist in charge of the center is highly knowledgeable about all aspects of computer applications. As the 'resident expert', she holds an 'open door' policy regarding the use of the media center and provides superb computer instruction for students, teachers, and even preservice teachers if they ask for help. Teachers and students are welcome to visit the media center at anytime to use the computers as a whole class activity or on an individual basis. In addition to the considerable, on-going computer activities in the media center, eighth grade students receive 55 minutes of keyboarding instruction from a certified computer teacher five days per week throughout the school year.

The Preservice Teachers and their Teaching Schedule

The 58 preservice teachers in the study were enrolled in one of three literacy early-field programs (i.e., prior to student teaching). Twenty-nine preservice teachers in a required 6 semester-hour reading/language arts block reported to Bay View Primary School (grades K-3) two mornings a week (8-10:45 AM) during the fall semester. On Monday mornings, with my guidance and support, the preservice teachers worked with small groups of students (the same students throughout the semester). The preservice teachers' lessons centered around use of quality children's literature, reading, writing, and arts connections (e.g., creative books-making, drama enactments, mural constructions, music), promoting students' strategic reading through reading comprehension strategies, and integrating reading instruction with computer technology. On Wednesday mornings, I offered demonstration lessons and lectures, and led seminar discussions.

Ten preservice teachers matriculating in a 3 semester-hour content reading class required for education majors seeking a concentration in reading reported to First Street Upper Elementary School (grades 4 and 5) two mornings a week during the spring semester (9:25-10:40 AM). On Tuesday mornings the preservice teachers offered literacy lessons in science, social studies, or language arts classes to small groups of students (the same students throughout the semester). The lessons centered around the use of strategies to promote students' comprehension of content text, writing in duel entry diaries, linking literacy with the arts (e.g., drama enactments, music, dance, mural constructions), and relevant use of computers to enhance reading instruction (e.g., locating information about text authors; researching why Plymouth Rock was moved from its original location; comparing and contrasting facts and details about Egyptian pyramids, oceans, and the solar system).

Nineteen preservice teachers studying content reading methods reported to Louis Middle School (grades 6-8) two mornings a week during the fall semester (9:25-10:40 AM). Working in science, social studies, or language arts classrooms, these preservice teachers followed the same schedule and lesson formats as the preservice teachers at First Street Upper Elementary

School, including the use of computers to enhance and optimize students' content literacy instruction.

Writing Teaching Cases

The preservice teachers also wrote two teaching cases describing their reflective thinking, concerns, and problems as they addressed the intricacies of devising and offering print-based literacy lessons augmented by computer technology. One case was written at mid-semester and the second case was written two weeks before the end of the semester.

To help the preservice teachers become familiar with the attributes of good cases, I introduced the topic of case writing (e.g., benefits of writing cases and attributes of good cases), during our first class meeting. At each subsequent meeting we read a teaching case authored by preservice teachers in field-based literacy courses (Richards & Gipe, 2000), and discussed the concerns portrayed in the case guided by questions, such as:

1) What do you think is the purpose of this lesson or series of lessons?

2) How was the original teaching plan interrupted?

3) What seems to be working well in this case?

4) What needs to be improved? (Richards & Gipe, 2000, pp. 9-10)

Guiding Preservice Teachers' Case Writing Efforts

I also offered the preservice teachers the following guidelines to structure and organize their case writing initiatives.

Guidelines for Writing Teaching Cases

1) Write at least two pages of double-spaced text about your concerns and dilemmas linking reading instruction with computer activities.

2) Offer sufficient contextual information to help readers understand your teaching context.

3) Include authentic dialogue.

4) Provide closure to your case by brainstorming some possible solutions to the dilemma described.

5) Title your case.

Conceptual Framework for the Inquiry

Four literatures informed my inquiry: a) tenets of social constructivism which suggest that language reveals individual's knowledge, perceptions, and beliefs (Goetz & LeCompte, 1984; b) ideas from discourse analysis that describe written texts as true reflections of human experiences (Gee, Michaels, & O'Connor, 1992); c) premises from social constructivism which suggest that as human beings encounter problems that emerge through circumstances, they move to resolve those problems through thoughtful reflection and action (Woods, 1992) and; d) Heideggerian phenomenology that seeks truth within the context of human experience (Rennie, 1999). In addition, I was mindful of traditions from hermeneutics which "indicate that the same text can be read [and interpreted] in a number of different ways" (Tappan & Brown, 1992, p. 186).

Questions Guiding the Inquiry

The preservice teachers' cases served as the main data source for the inquiry. Therefore, I sought to answer the following questions:

1) What themes are visible in the preservice teachers' cases?

2) Are the case themes related to the primary, upper elementary, or middle schools in which the preservice teachers worked?

3) Does the content of the cases illuminate instructional gaps or shortcomings that I, as program supervisor, need to remedy?

4) Are the implications of the research germane to teacher education and school districts?

Research Methodology

Data Sources

I examined 58 cases written by the 29 preservice teachers in the Bay View School, 20 cases written by the ten preservice teachers in First Street Upper Elementary School and 38 teaching cases authored by the 19 preservice teachers in Louis Middle School (total = 116 cases).

First, I collated the cases according to the three teaching contexts in which the preservice teachers worked. Then, following analytic induction methods (Bogdan & Biklin,1992), I read and reread the cases, identifying and coding the encompassing themes (e.g., "students' lack of keyboarding skills"; "misuse of CD Rom applications"). The coding process allowed the data to emerge (Maxwell, 1996; Miles & Huberman, 1994). I also interviewed the preservice teachers, and scrutinized my observation field-notes and the preservice teachers' dialogue journal entries in order to cross-check and triangulate different types of data that focused on the same phenomenon (Gordon, 1980). As a validity and member check of the accuracy of my judgment, the preservice teachers read and gave their approval of the manuscript.

Analysis revealed that the 58 cases written by the 29 preservice teachers enrolled in the combined reading/language arts block in Bay View Primary School (grades K-3) portrayed three dilemmas associated with linking literacy lessons with computer activities. These three issues were: 1) preservice teachers' use of computer technology in ways that were not meaningfully integrated with literacy instruction; (24%/14 cases) 2) preservice teachers' insufficient planning and preparation pertinent to the use of computer technology (25.9%/15 cases) and; 3) computer technology malfunctions and glitches (50%/29 cases).

Analysis of the 20 cases authored by the preservice teachers at First Street Upper Elementary School (grades 4 and 5) revealed four dilemmas. These four dilemmas were: 1) preservice teachers' use of computer technology in ways that were not meaningfully integrated with literacy instruction (14%/3 cases); 2) preservice teachers' insufficient planning and preparation pertinent to the use of computer technology (14%/3 cases); 3) computer technology malfunctions and glitches (30%/6 cases) and; 4) students' lack of keyboarding

skills (40%/8 cases).

Examination of the 58 cases written by the preservice teachers at Louis Middle School (grades 6-8) revealed two dilemmas: 1) preservice teachers' use of computer technology in ways that were not meaningfully integrated with literacy instruction (39.%/15 cases) and; 2) preservice teachers' insufficient planning and preparation pertinent to the use of computer technology (60.5%/23 cases) (see Table for the number and percent of cases in each category in each school context). The following cases portray these themes.

Concern # 1: Preservice Teachers' Use of Computer Technology in Ways That Were Not Meaningfully Integrated with Literacy Instruction

"I Didn't Expect This!"

First, my fifth graders and I completed the text chapter on the heritage and culture of the Mississippi Natchez Trace. We read about the Choctaw Indians and viewed photographs of native American artifacts, like tomahawks and flint arrow points. The text also discussed how wagons were pulled by mules one hundred years ago. We used the SQ3R strategy (Robinson, 1961), and the students really did nicely turning the subtitles and first sentence of every paragraph into questions. Surprisingly, they didn't think that the strategy was too tedious or boring. I had heard that this strategy is effective because it helps readers remember what they have read. But, some students don't like SQ3R because it requires them to carefully read and reread informational text. Consequently, it slows down their reading time.

After we completed the chapter, I assembled my group of eight students around the only computer in the classroom. I had brought in what I thought was a wonderful interactive CD Rom video. It depicted horses native to the American west. The video is designed so that viewers can manipulate the horses' tails, hooves, movements, etc., and the scenery, such as barns, trees, mountains, pastures, and fences. The students loved it and we stayed at the computer for about twenty-five minutes. Only later did I find out that there were concerns about my linking the content of the text with a computer activity.

When the lesson was over, the classroom teacher asked me. "Didn't you realize that the other students in the room were angry because they didn't get to use the computer?"

She also said, "You were on the computer too long. Your students needed to be reading." Then, she told me, "I think that the **game** you brought in had nothing to do with the text chapter."

Well, I have to rethink everything about the lesson. I know that my students absolutely loved the computer venture. It was the very first time I ever linked a reading lesson with technology and I thought the connection helped to reinforce what my students read in the chapter. It also helped my students visualize horses and their surroundings. And, I noticed that the students who had some difficulties reading the text especially were enthralled with manipulating the pictures on the computer screen. What went wrong?

Concern # 2: Preservice Teachers' Insufficient Planning and Preparation Pertinent to the Use of Computer Technology

"The Name Game"

I teach in a first grade classroom once a week. My group is composed of three girls and one boy. This week we were reading the story *Luke's Quilt* (Guback, 1984). It's about a girl who lives in Hawaii. While searching on the Internet, I found this web site <http://www.hisurf.com/hawaiian/names.htlm> where you could type in your English name and you get a translation of your name in Hawaiian. I was so excited with my find that I couldn't wait to share it with my students.

Before we began the story, we looked at a non-fiction book about Hawaii. The children were impressed with the beautiful beaches and flowers. There were also pictures of Hawaiian people. Darien asked me, "Why do all the people look Chinese?'

I did not expect this question and truthfully, I did not have an answer for it. I did explain that they weren't Chinese, but they were Hawaiian and American. This fact went right over her head and she said, "Yeah, but why do they look Chinese?'

I moved on quickly to something that I knew they would understand. I explained that

Hawaiians have their own way of saying, 'Hello' and it is 'Aloha'. The children thought it was fun to learn a Hawaiian word and they kept saying, "Aloha."

Ashley asked, "Miss Patti, how do you say I love you in Hawaiian?"

I told her I wasn't sure, but I had a way to look it up. I also said, "We are going to go on the Internet to find our Hawaiian names."

We all sat around the computer and I pulled up the web site. First, we used the Hawaiian dictionary and found out how to say, "I love you." So far, so good! We decided to try my name first. I typed in 'Patti', hit enter, and came up with my Hawaiian name, 'Pakelikia.'

We decided to try Bria next. I typed in her name and hit enter and up came 'Palaina'.

Ashley was next so I typed in her name and hit enter and ... nothing! This little box popped up that said, '**Sorry this name is not in our data base**."

I certainly did not expect this and I had to think quickly. I had what I thought was a great idea. "Let's try your middle name," I said.

Ashley looked happy, but when she tried to tell me her middle name it made no sense. I was already thinking to myself that if I had trouble with the name Ashley, I was in for it with my next two students, Darian and Gavin. My assumptions were correct. Their names were not in the data base. My nice project had turned into an ordeal and a disaster.

What I should have done was tried to find all of the students' names prior to the lesson. It didn't even occur to me that I could not find certain names. I did not plan ahead. I just assumed that my wonderful idea would turn out okay.

Concern # 3: Computer Technology Malfunctions and Glitches

"Blank Screens"

When I met my second grade students' classroom teacher one of my first questions was, "Do you use the computers in your room and access the Internet very often?" To my surprise she answered, "Not very often."

Of course I decided to link my print-based literacy lessons with computer technology

literacy activities as often as I could. Therefore, as a post-reading activity last week, I planned to help my students find information on the Internet about the author of our story. From Day One, two fully equipped computers were in the classroom and I wanted to make good use of them.

As I was setting up my supplies for the lesson, I told the teacher that we would be using the Internet. She said, matter of factly, "The computers are out, but I have a set of encyclopedias."

I asked, "Why aren't they working?"

She answered, "I don't know. I only complete a form and turn it into the office. They handle it from there. It's not just me either. Three or four other teachers can't use their computers either. They've been out for a week or longer."

I went to the office to inquire about the problem and the secretary said, "I'm not familiar with that particular concern, but a man comes to the school once every other week and works on computer difficulties. It sounds like a wiring problem if four computers are out."

I was really upset because I did not have a back-up for a post-reading strategy. I did not know what to tell the students. Should I have tried to look up the author in the encyclopedia? I doubt if I could have found the information. I was in a panic, but I did not want my students to know that I was upset. Should I have tried to 'plug in' another post-reading strategy? Reflecting on my dilemma, I could have asked the classroom teacher if we could go to another teacher's room and use the computers. I could have gone to the school library. I bet they have computers there. A little prior planning on my part would have saved the end of the lesson and kept me from a panic attack.

Concern # 4: Students' Lack of Keyboarding Skills

"Having Computers In Classrooms Isn't Always the Answer"

I work with seven sixth graders every week, helping them comprehend content text material. We always link reading lessons with writing, and connect our lessons to technology. Two weeks ago, after completing a chapter about the state of Mississippi, I decided to have my students create an imaginary brochure, describing the interesting sights and activities in the

state. First, I had the students create their brochures on paper. Then, all eight of us (seven students and me), sat around the three computers in the room. As three students typed their brochures, the other four watched. Can you already figure out that I had problems? Here is what happened. First, the four students who were watching their peers type got bored and began to disturb the other students in the room. Then my professor came is to observe and she looked at my students transferring their writing to the computer. "Why did you have them compose first on paper?" she asked?

I had to reply, "I don't know. I never thought of having the students compose directly at the computer."

Then, my professor looked carefully at the students' writing. Here is how Mary's brochure looked on the computer screen:

1) We can go swimming.

2) We have beaches.

3) It is warm here.

"Why is Mary typing a list, rather than a complete descriptive paragraph?" asked my professor?

Again, I had no clever answer.

"Next week, I'll do a demonstration lesson about the processes of prewriting, writing and post writing," my professor said. "I'll use a strategy titled 'Steps to Independent Writing'. It helps writers figure out what they know about a writing topic and it helps writers structure cohesive paragraphs" (Richards, in press).

The following week, after learning the steps in the strategy, I presented it to my students. They loved it! First, they created a semantic map of their ideas and then they transformed the ideas in their semantic maps into category columns (e.g., ideas that were related to one another were grouped together, such as all of the interesting places to visit in Mississippi).

Well, we were ready now to get to the computers. I left four of my students sitting in a semi-circle. Their task was to read the next chapter in their book. I took the remaining three students with me to the computers. I expected them to really ZOOM along with their writing.

WRONG!! Each student typed in a laborious, slow way. They used only one hand and rested their other hand in their laps. Two just used their index fingers to type. "Come on," I said. "Let's get going. We need to move along so the others can type too."

"We can't type," said Jennie.

"Why can't you type?' I asked. "You all go to the computer lab and get 45 minutes of computer instruction everyday."

"Yeah, but we don't learn how to type," replied Carey.

Well, these incidents have let me know that there is more to linking literacy lessons with computers than just sitting kids down in front of computer monitors. Using the computers actually slowed up my students' efforts at composing brochures. How do other teachers handle this?

Discussion

It must be acknowledged that the findings of this inquiry cannot be generalized to other preservice teachers and teaching contexts (see Merriam, 1998). To a great extent, school contextual influences determine what preservice teachers learn and perceive important, and what problems they encounter (Richards, Moore, & Gipe, 1997). In addition, it must be noted that I directed the preservice teachers to confine their case writing only to the problems they experienced as they integrated their literacy lessons with technology. Their technology accomplishments are not part of this inquiry.

Despite the lack of generalizability, the research provides some intriguing narrative evidence that supports teaching cases as windows into preservice teachers' lived experiences and realities. Analysis of the preservice teachers' cases highlighted concerns about integrating literacy lessons with computer technology in three different teaching contexts. Therefore, in this particular inquiry, cases served as valuable data.

The findings of the inquiry indicate that school context accounted for (50%) of the preservice teachers' concerns at Bay View Primary School and (70%) at First Street Upper Elementary School. In particular, antiquated computers and inadequate wiring served to

exacerbate the preservice teachers' frustrations and problems as they worked to augment their literacy lessons with computer technology activities. Further, the lack of a 'resident computer expert' at Bay View and First Street Upper Elementary prohibited the preservice teachers (and classroom teachers and students), from being able to seek help when necessary (see the case, "Blank Screens"). In addition, although students' lack of keyboarding skills was not a problem to the preservice teachers at Bay View School, it was a concern for the preservice teachers at First Street Elementary School (i.e., 40% of the cases). It is not surprising that the preservice teachers at Bay View School did not consider students' lack of keyboarding skills as problematic. Most K-3 students are not expected to be proficient typists, and in all probability, the preservice teachers did not plan for these younger students to engage in e-mail, word processing, or Internet research activities. On the other hand, the preservice teachers working in First Street Upper Elementary School were concerned about their students' lack of keyboarding skills. In fact, most of the preservice teachers assumed that the fourth and fifth grade students at First Street School would be able to type (see the case, "Having Computers in Classrooms Isn't Always the Answer"). In actuality, experts disagree about the age at which students should receive keyboard lessons (see Leu & Leu, 1997). According to Westreich (2000) keyboarding should be taught by fourth grade "in order to take maximum advantage of technology. By this age...students have made the transition to formal operations and are capable of making abstract connections between symbol systems and thought processes" (p. 23).

Across the three teaching contexts, 23 cases out of 116 written by the preservice teachers described using computer technology in ways that were not meaningfully integrated with literacy instruction. Forty-one cases out of 116 discussed the preservice teachers' inadequate planning and preparation for their computer activities (total = 64 cases/55%) (see cases, "I Didn't Expect This!" and "The Name Game"). As supervisor in charge of these literacy programs, I must accept responsibility for the two issues that directly relate to guiding preservice teachers' professional development. I assumed that the preservice teachers were knowledgeable about ways to integrate computer technology with print-based literacy lessons and I left it to their judgment to choose appropriate software and computer applications that

would complement and extend narrative and content text. Certainly, the preservice teachers' lack of prior planning and preparation correlate with their understandable lack of overall teaching experience (see Byra & Coulon, 1992). My preservice teachers are consistently well-prepared for their print-based literacy lessons because I emphasize the connections between preparation for teaching reading, teaching effectiveness, and student achievement (Peterson, 1978). Yet, I overlooked the import of carefully planning computer initiatives.

Implications for School Districts and Teacher Education

The research indicates that school districts and university supervisors must work in concert in order to provide optimum opportunities for preservice teachers (and classroom teachers and students) to become proficient in utilizing all aspects of electronic communication in classroom settings. The inquiry spotlights the importance of schools providing the best computer equipment and technology support systems they can afford. Studies indicate a positive relationship between pupil expenditures and student achievement (Fortune & Spofford-Richardson, 2000). Often, students and teachers at Bay View and First Street Schools could not use their classroom computers because they were not in working order. In addition, wiring problems and lack of a 'resident computer expert' prohibited the preservice teachers students, and classroom teachers from achieving their full potential and goals. "Integrating technology with instruction requires that teachers,...administrators [and school district officials] deal with a variety of technical, curricular, financial, and other obstacles" (Reinking & Watkins, 2000, p. 387). It is clear that simply having computers available in classrooms does not mean that instruction will be powerfully transformed (Reinking, Labbo, & McKenna, in press).

The study also pinpointed significant variations in the computer instruction offered to upper elementary students (grade 4 and 5) and middle school students (grade 6, 7, and 8) in the same school district. Forty percent of the cases authored by the preservice teachers at First Street Upper Elementary School discussed problems revolving around students' lack of keyboarding skills. On the other hand, preservice teachers working in Louis Middle School did not consider

their students' keyboarding abilities to be an issue. It is intriguing to note that although students at First Street Upper Elementary School visit the computer lab five days per week, they do not receive keyboard instruction. In contrast, eighth grade students at Louis Middle School receive daily keyboarding instruction and all 6-8 grade students receive individual computer instruction from the media specialist, if they choose. This considerable discrepancy in instruction is, in all probability, related to school district policies and guidelines that consider eighth grade students developmentally mature enough to receive and benefit from keyboarding lessons.

The inquiry also offers practical information to literacy teacher educators who increasingly will require their preservice teachers to implement technology in field-based courses. Specifically, the inquiry accentuates gaps in course instruction that I, as supervisor must take steps to remediate. Clearly, I must become more 'computer literate' so that I can model appropriate use of computer software and supply relevant readings for my preservice teachers relating to selection and use of suitable computer software. I also need to emphasize to my preservice teachers the importance of carefully planning and preparing for computer endeavors.

Finally, the inquiry shows that simply requiring preservice teachers in field-based courses to integrate literacy lessons with technology without considering their school context and determining what preservice teachers already know about computers will, in all likelihood, prove less than satisfactory. Scholars have "argued that schools often intentionally or unintentionally subvert any possibility that new technology will transform existing instructional practices" (Reinking & Watkins, 2000, p. 387) (also see Papert, 1993). This results of this research indicate that we (the school district and I), unintentionally inhibited the preservice teachers' successful implementation of technology. In this case, Leu's cautions (2000) about the possible negative consequences of rapidly infusing technology with literacy instruction without careful planning proved correct.

Please Note: The names of the schools in this inquiry are pseudonyms.

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Table

Predominant Case Themes and Number of Cases
in Each Category for Each School Context

Bay View Primary School - 58 Cases
First Street Upper Elementary School -20 Cases
Louis Middle School - 38 Cases

Themes	Bay View School n %	First Street School n %	Louis School n %
inappropriate use of computer technology	14 (24%)	3 (14%)	15 (39%)
insufficient planning and preparation	15 (25.9%)	3 (14%)	23 (60.5%)
computer malfunctions and glitches	29 (50%)	6 (30%)	____
students' lack of keyboarding skills	____	8 (40%)	____

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